

**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**LISTING OF CLAIMS:**

Claims 1-16 (Canceled)

17. (Currently Amended) A method of extracting a radial velocity characteristic of a target from one or more coherent radiation pulse bursts comprising the steps of:

- (a) receiving radiation echo returns of the pulse bursts from a remote scene;
- (b) processing the echo returns into in-phase (I) and quadrature (Q) components;
- (c) measuring returns at intervals to provide sampled data;
- (d) applying a predetermined function to the I-Q returns;
- (e) modifying the predetermined function based on phase and amplitude to match the sampled data as a function of velocity; [[and]]
- (f) determining the target radial velocity in dependence upon said modification step of the predetermined function, and
- (g) outputting the determined target radial velocity.

18. (Previously Presented) A method as claimed in Claim 17 wherein step (d) comprises fitting a curve to the I-Q returns and step (e) comprises optimising the fit to the sampled data as a function of velocity in a least squares fashion.
19. (Previously Presented) A method as claimed in Claim 18 wherein a model of clutter return is provided for use in steps (d) and (e).
20. (Previously Presented) A method as claimed in Claim 19 wherein the model of clutter return is a low order polynomial function in I and Q.
21. (Previously Presented) A method as claimed in Claim 17 further comprising the step of extracting target amplitude from the sampled data.
22. (Previously Presented) A method as claimed in Claim 17 further comprising the step of extracting range ambiguity from the sampled data.
23. (Previously Presented) A method as claimed in Claim 17 further comprising the step of extracting target azimuth from the sampled data.

24. (Previously Presented) A method as claimed in Claim 20 wherein the echo returns are measured at non-equi-spaced intervals.

25. (Previously Presented) A method as claimed in Claim 24 wherein the pulse bursts are transmitted at a frequency which is changed between successive pulses.

26. (Previously Presented) A method as claimed in Claim 24 wherein each pulse burst consists of multiple pulses transmitted at non-constant pulse repetition internal bursts.

27. (Previously Presented) A method as claimed in Claim 24 wherein the pulse bursts are internally coherent and mutually incoherent.

28. (Previously Presented) A method as claimed in Claim 17 further comprising the step of carrying out conventional Moving Target Indication/Moving Target Detection filtering and target detection before applying a predetermined function, as in step (d), to the I-Q returns in which a target was detected.

29.-32. (Cancelled)

33. (Previously Presented) A method as claimed in Claim 17 wherein a model of clutter return is provided for use in steps (d) and (e).

34. (Previously Presented) A method as claimed in Claim 33 wherein the pulse bursts are transmitted at a frequency which is changed between successive pulses.

35. (Previously Presented) A method as claimed in Claim 33 wherein each pulse burst consists of multiple pulses transmitted at non-constant pulse repetition internal bursts.

36. (Previously Presented) A method as claimed in Claim 33 wherein the pulse bursts are internally coherent and mutually incoherent.